

In the Abstract

Page 12, at the end of line 6, insert:

C8

--The cap layer may include within it an antireflective coating or a light blocking layer.--

REMARKS

I. General

This Amendment is Applicants' response to the Office Action dated September 20, 2002 ("Office Action"). The pending claims in the present application are claims 11-18, 21-28, and 31 - 46. The Examiner has rejected all of the pending claims under one or more of the following statutory provisions: 35 U.S.C. §§ 102, 103, and/or 112. The Examiner has also objected to the specification, abstract, and drawings. In this Amendment, Applicants have traversed each of the Examiner's bases for rejecting the claims and objecting to the specification, Abstract, and drawings. As such, Applicants respectfully request that the application be passed to issue in due course.

In the numbered Section 3 of the Office Action, the Examiner indicated that the specification must be amended to reflect the current status of the application. To comply with this request, Applicants have amended the specification as indicated above to add that the referenced continuation application is "now abandoned." This amendment overcomes the Examiner's objection.

In numbered Section 4 of the Office Action, the Examiner states that the Abstract must be amended to be aligned with the claimed invention. Applicants have amended the Abstract in the Section "In the Abstract" above to reflect the claimed invention. This amendment overcomes the asserted objection.

The Examiner, at numbered Section 5, has objected to the Applicants' June 13, 2002 amendment and contends that it added new matter to the application. The Examiner submits that the specification supports a cap layer that may include either an anti-reflective coating or a light blocking layer. The specification and claims of the present invention and drawings have been amended to reflect this feature. As such, the Examiner's argument that the amendments to the specification, claims, and drawings add new matter is traversed and should be withdrawn.

The Examiner has requested that Applicants file a supplemental Oath or Declaration in light of new matter being added to the application pursuant to 37 C.F.R. § 1.67. Applicants submit that this is not necessary given the claims have been amended to what the Examiner suggested which is fully supported by the specification as filed -- meaning no new matter has been added to the application. (See Section III below). Accordingly, the objection is moot.

II. Drawings

In numbered Section 2, the Examiner has objected to the drawings under 37 C.F.R. § 1.83(a). The Examiner has requested that the drawings be amended to show an anti-reflective coating and a light blocking layer. Applicants have added Figure 3 to show the embodiment of the present invention with an anti-reflective coating and Figure 4 to show the embodiment with a light blocking layer. This does not add new matter to the application. Applicants attach as Attachment 2, Figures 3 and 4 that show the two embodiments described in the specification.

III. The Section 112 Rejections Are Traversed

In the Office Action, the Examiner rejected all of the pending claims, claims 11-18, 21-28, and 31-46, under 35 U.S.C. §§ 112, first paragraph, for containing subject matter not described in the specification. The Examiner has suggested language to include in independent claims 11, 21, 31, and 39 to overcome this rejection. Applicants have followed the Examiner's suggestion and amended these claims accordingly and these amendments are supported by the specification as the Examiner has pointed out.

Given that Applicants have amended claims 11, 21, 31, and 39 as suggested by the Examiner, they have overcome the bases for rejecting these claims under 35 U.S.C. §112, first paragraph. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 12-18 depend from claim 11, claims 22-28 depend from claim 21, claims 32-38 depend from claim 31, and claims 40-46 depend from claim 39. Since each of these dependent claims add features to the independent claims from which they depend, each will traverse the rejection based on 35 U.S.C. § 112, first paragraph, for the same reason as their respective independent claims. Therefore, Applicants respectfully request

that this rejection be withdrawn with respect to dependent claims 12-18, 22-28, 32-38, and 40-46.

IV. Heat Leaching is Known in the Art

The Examiner has rejected claims 18, 28, 38, and 46 under 35 U.S.C. § 112, first paragraph. The substance of the rejection is that the Examiner contends that "leaching" with heat to remove impurities was not known at the time of the invention. Specifically, the Examiner stated the following with regard to leaching:

Referring to page 6, lines 22-24, and to claims 18, 28, 38, and 46, the specification does not disclose any of the particulars as to how to leach sodium constituents from a glass substrate. The plain meaning of the word, "leach" is "to remove soluble constituents...by the action of a percolating liquid." As glass is vitreous, it is unknown how any liquid could percolate through a glass substrate so as to leach sodium.... Consequently, it is the position of the Examiner that the specification fails to teach how to leach sodium from the substrate without undue experimentation.

In the July 20, 2001, response, Applicants' brought to the Examiner's attention U.S. Patent Nos. 6,063,690 and 6,059,887. The '690 patent uses the term "leaching" to describe the method for the removing impurities using heat. The '887 patent describes the same process but does not use the specific word "leaching." This is the proof that the Examiner requested that showed the term "leaching" with heat, not percolating a liquid, was known in the art. However, the Examiner now contends that this is not sufficient because these patents were not in the public domain at the time of the invention.

Applicants attached as Attachment 4 to the June 13, 2002 amendment, a copy of U.S. Patent No. 5,444,001 which is titled "Method of Manufacturing a Semiconductor Device Readily Capable of Removing Contaminants from a Silicon Substrate." This patent issued August 22, 1995. At column 6, lines 49-57, it describes the use of heat to drive out contaminants. This is heat leaching as would be understood by a person of ordinary skill in the art. Accordingly, that person would understand from the use of the term "leaching," as it is used in the present application, would be heating the material to a temperature sufficient to leach out the contaminants, not the use of a percolating liquid as the Examiner contends.

The '001 patent discloses the method that Applicants have used to remove contaminants. Applicants have chosen to refer to it as "leaching." This term heat leaching as it is used in the present application would be understood by one skilled in the art and such a person would know how to make and use the invention. Further, since Applicants are their own "lexicographers" and have chosen to refer to a known method to remove contaminants as leaching as sufficiently defined under the case law.¹ Therefore, noting the foregoing, Applicants have traversed the Examiner's basis for rejecting claims 18, 28, 38, and 46 under 35 U.S.C. § 112, first paragraph, and respectfully request that it be withdrawn.

V. The Present Invention is Novel and Nonobvious

In the Office Action, the Examiner has relied on U.S. Patent No. 5,534,744 ("the '744 patent") to reject certain claims of the application under 35 U.S.C. § 102 for anticipation and 35 U.S.C. § 103 for obviousness. Applicants have reviewed the '744 patent and submit that this reference does not anticipate or render obvious any of the claims of the present application. This will be shown in the remainder of this Section.

A. Claims 11, 13, 15, 17, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 are not Anticipated

1. The only reference that the Examiner has cited in rejecting the claims 11, 13, 15, 17, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 is the '744 patent. Claim 11, 21, 31, and 39 are independent claims and the remainder are dependent claims. The examiner states the following in rejecting the claims"

...Leroux et al. [the '744 patent] disclose a cathode substrate including a substrate 2 (see FIG. 6), a cap layer (silica layer 4), an anti-reflective coating (see col. 5, lines 49, 50, underlays 52), and an array of emitter tips 12.

The basic structure that is shown in Figure 6 is described with respect to Figure 1 (which is in the prior art). The '744 patent states the following about the structure of Figure 1 and, therefore, Figure 6 with respect to what the Examiner contends teaches the present invention (column 1, lines 38-45):

¹ See ZMI Corp. v. Cardiac Resuscitator Corp., 844 F.2d 1576 (Fed. Cir. 1988).

An embodiment of the known electron source is diagrammatically shown in plan view in FIG. 1A and in sectional view in FIG. 1B, which is the section CC of FIG. 1A.

This known source has a matrix structure and comprises an e.g. glass structure 2 and optionally on the latter a thin silica film. On the latter is formed a series of electrodes in the form of parallel conductive strips serving as cathode conductors and constituting the columns of the matrix. (Emphasis added)

The foregoing quotation makes plain that the silica layer 4 is not needed since it may be optionally provided. This means that the underlying substrate, glass structure 2, can appropriately have the cathode conductors placed on it without degradation in performance. If this were not the case, the silica layer 4 would have been mandatory.

In present invention, the cap layer is not optional, it is mandatory. The cap layer is needed to protect against the low quality substrate. In fact, the present application even permits the substrate to be formed from plastic because of the existence of the cap layer. There is no teaching or suggestion in the '744 patent that the substrate could be soda-lime glass that requires a cap as is taught by the present invention so that there would be proper performance of the structure. In fact, if the '744 patent is followed, the structure in the typical case provide for placing the cathode conductors on the soda-lime or plastic substrate. As would be known in the art, such a structure would not work properly. Therefore, the '744 patent does not anticipate the claims 11, 13, 15, 17, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 of the present invention and this rejection should be withdrawn.

2. Applicants also submit that the Examiner has misread the quoted section of the '744 patent at column 5, lines 49 – 51. If the entire pertinent section is read, it states the following: (column 5, lines 32 – 51):

In this case, it is possible to produce a new screen structure in which luminophor 48 is observed from its excitation side through the micropoint source (the silica layers 4 and 8 being transparent to light 50 and the substrate 2 being e.g. made from glass so as to be also transparent). This also makes it possible to improve the luminous efficiency of the screen and consequently lower its electric power consumption. In this case, it is preferable to choose conductive 46 a layer able to reflect the light 50 emitted by the luminophor.

In the case of a screen according to the invention, which is observable through its electron source [silicon layers 4 and 8], each

cathode conductor and each grid are preferably formed on an under layer 52 able to absorb the light 54 outside the screen, as shown in the embodiment of FIG 6. This makes it possible to improve the contrast of the screen illuminated by said light 54.

Therefore, the said external light 54 is absorbed instead of being reflected toward the observer.

The quotation above, as will be explained, makes plain that the '744 patent does not anticipate or render obvious the claims of the present invention.

The first portion of the above quotation refers to Figure 5 and that the luminophor 48 is observable through silica layers 4 and 8. The Examiner has equated silica layer 4 to the cap layer of the present invention. In this embodiment in the '744 patent, the conductive layer 46 is a material that will reflect the light emitted by the luminophor. It is to be noticed in Figure 5 that the light passes through cathode conductors 5.

In the second portion of the above quotation, there is the added feature of the under layer 52 to absorb the light 54 as shown in Figure 6. This is clearly shown by the two light rays in Figure 6. The first light ray is absorbed by under layer 52 that is beneath cathode conductor 5 and the second light ray is absorbed by under layer 52 that is beneath square 10a. The under layers that are shown in Figure 6 are not associated with or within silica layer 4 that is shown in this Figure. Moreover, given that under layers 52 are associated specifically with the cathode connectors 5 and square surfaces 10a wherever they may be located, it would not render obvious the claims of the present invention that have an anti-reflective coating or light blocking layer within the cap layer.

Claims 12-18 depend from claim 11, claims 22-28 depend from claim 21, claims 32-38 depend from claim 31, and claims 40-46 depend from claim 39. Each of the dependent claims that is not separately cited in the rejection traverses the Examiner's rejection for anticipation for the same reasons as set forth for the claims from which each depends. Accordingly, this rejection should be withdrawn.

Applicants have overcome the anticipation rejection under 35 U.S.C. § 102. Therefore, Applicants have traversed this rejection and respectfully request that it be withdrawn.

B. Claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 are Non-Obvious

In the Office Action, the Examiner rejected dependent claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 for obviousness under 35 U.S.C. § 103 based on the '744 patent. In rejecting these claims, the Examiner stated he following:

Referring to claims 12, 22, 32, and 40, Leroux et al. [the '744 patent] disclose a cathode substrate as recited in claims 11, 21, 31, and 39 including a substrate 2 made of glass. See col. 1, lines 41-45. Leroux et al. do not disclose a cathode substrate wherein the substrate 2 [is] made of soda-lime glass. The selection of known materials for a known purpose is generally considered to be within the skill in the art. It would have been obvious to use soda-lime glass, for the substrate 2, as disclosed by Leroux et al., because the selection of known materials for a known purpose is generally considered to be within the skill of the art.

Specifically, in rejecting claims 12, 22, 32, and 40, the Examiner's position is that it would be known in the art to select soda-lime glass or other inexpensive substrate, including plastic, for the structure that is shown in Figure 1 of the '744 patent is not supported by this patent. As discussed in the preceding Section (relating to the claims not being anticipated by the '744 patent), it was made clear that the structure in Figure 1 optionally uses silica layer 4 and that if the section of the '744 patent properly read claims 11, 13, 15, 17, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 are not anticipated and rendered obvious. Therefore, the '744 does not anticipate any structure (i) that does not employ layer 4 as a requirement and allows for the placement of the cathode conductor matrix directly on the substrate, or (ii) that includes features such as having a cap layer that include an anti-reflective coating in light blocking layer. Further, the '744 patent does not teach, suggest, or contemplate structures that use inexpensive substrates, such as soda-lime glass or plastic. If the '744 patent recognized this, it would not have made the use of layer 4 optional but mandatory as in the present invention. If plastic or soda-lime glass was used without the cap, one skilled in the art would understand that the resulting product would not perform according to specifications. Noting this, Applicants have traversed the obviousness rejection as it has been applied to claims 12, 22, 32, and 40.

The Examiner has rejected claims 14, 24, 34, and 42 for obviousness based on the '744 patent. These claims are directed to the thickness of the cap layer. The Examiner has

considered the thickness to be within the skill in the art even though the '744 patent is silent about the thickness.

Applicants submit that claims 14, 24, 34, and 42 depend from claims for that are not rendered obvious by the '744 patent. The reasons for this are set forth in Section V.A. and the first portion of this Section V.B. above. These reasons are incorporated here by reference. Given this, Applicants have traversed the Examiner's basis for rejecting claims 14, 24, 34, and 42 for obviousness based on 35 U.S.C. § 103.

The Examiner has rejected claims 16, 26, 36, and 44 for the same reasons as claims 12, 22, 32, and 40. As such, Applicants apply the same bases for overcoming the obviousness rejection to these claims as it applied to overcoming the rejection to claims 12, 22, 32, and 40. Therefore, Applicants have traversed the grounds for rejecting claims 16, 26, 36, and 44.

It is to be noted that claims 12, 14, and 16 depend from claim 11, claims 22, 24, and 26 depend from claim 21; claims 32, 34, and 36 depend from claim 31; and claims 40, 42, and 46 depend from claim 39. As such, these dependent claims add features to the independent claims from which they depend and each includes the features of such independent claims. Applicants have demonstrated that independent claims 11, 21, 31, and 39 are not anticipated or rendered obvious by the '744 patent, and for these same reasons, dependent claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 are not anticipated or rendered obvious by the '744 patent.

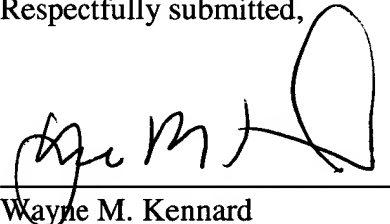
Applicants have traversed each of the grounds for rejecting dependent claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 for obviousness under 35 U.S.C. § 103 based on the '744 patent. Noting this Applicants respectfully request that this rejection be withdrawn.

VI. Conclusion

Applicants have traversed each and every objection and rejection that the Examiner raised in the Office Action date September 20, 2003. As such, the specification, abstract, and claims are in condition for allowance. The present invention is new, non-obvious, and useful. Reconsideration and allowance of the claims are requested.

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Respectfully submitted,



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Attachment 1 (marked up Claims)

11. (Thrice Amended) An improved cathode substrate for a field emission display, comprising:
- a substrate;
 - a cap layer disposed on said substrate;
 - an anti-reflective coating, with the anti-reflective coating being included [with] within the cap layer; and
 - an array of emitter tips formed on said cap layer with the anti-reflective coating within it.
21. (Thrice Amended) An improved cathode substrate for a field emission display formed by the steps of:
- providing a substrate;
 - depositing a cap layer with an anti-reflective coating within it on the substrate;
 - and
 - forming an array of emitter tips on the cap layer with the antireflective coating within it.
31. (Twice Amended) An improved cathode substrate for a field emission display, comprising:
- a substrate;
 - a cap layer disposed on said substrate;
 - a light blocking layer, with the light blocking layer being included [with] within the cap layer; and
 - an array of emitter tips formed on said cap layer with the light blocking layer.
39. (Twice Amended) An improved cathode substrate for a field emission display formed by the steps of:
- providing a substrate;
 - depositing a cap layer with a light blocking layer within it on the substrate; and
 - forming an array of emitter tips on the cap layer with the light blocking layer within it.

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